Ocybadistes ardea male in flight and female ovipositing on Basket Grass (*Oplismenus aemulus*) Sunshine Coast, Queensland

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PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine. See BOIC Programme.

CONTACT ADDRESS AND MEMBERSHIP DETAILS

PO Box 2113, Runcorn, Queensland 4113
Membership fees are $25 for individuals, schools and organizations.

AIMS OF ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you want to submit an item for publication the following deadlines apply:
March issue – February 1st June issue – May 1st
September issue – August 1st December issue – November 1st

COVER

Ocybadistes ardea male in flight and female ovipositing on Basket Grass (*Oplismenus aemulus*), Sunshine Coast, Queensland - Painting by Andrew Atkins

FROM THE PRESIDENT

Murdoch De Baar, a long-standing member of the BOIC and a good man, passed away on January 6th 2011. Together with the club's only Past President and life member, Helen Schwencke, I spoke with Mrs De Baar after the funeral service for Murdoch. We expressed condolences on behalf of all club members. You will read of Murdoch in Trevor Lambkin's obituary on page 9 of this edition.

As happens each quarter, I am somewhat in awe of those members whose unpaid hours of observation, research, recording and writing produce articles of such interest and information for our readers. I hope our current writers (whom I thank profusely) will not feel excluded, if in the limited space available, I single out Andrew Atkins for his meticulous work on the Orange Grass Dart butterfly and congratulate him for his wonderful artwork.

I make a special plea for members willing to offer a few hours on occasion to help "staff" a BOIC display. We often are forced to decline invitations from various organisations, as our pool of active workers is rather limited.

The Club's Annual General Meeting will be held on April 2nd next and I urge you to attend if within range of the IndigiScapes Centre at that time.

Best wishes ***Ross***

IN THIS ISSUE

The life history of the skipper butterfly *Ocybadistes ardea* Bethune Baker, 1906 (Lepidoptera: Hesperiidae) from southern Queensland

Andrew Atkins, P.O. Box 42, EUDLO, Queensland. 4554

Abstract

The biology of *Ocybadistes ardea* Bethune-Baker, 1906 (the Orange Grass-dart) is described from the subtropical rainforests of the Sunshine Coast. The skipper is apparently restricted to small breeding areas, and the winter brood duration is unknown, but probably involves several months of delayed development (diapause) of juveniles, with adults flying from January to April in southern Eastern Australia.

Introduction

Averaging a wingspan (wing-tip to wing-tip) of barely 2cm, the male Orange Grass-dart (*Ocybadistes ardea* Bethune-Baker, 1906), is one of the smallest skipper butterflies in the world, and perhaps the brightest in the Australasian tribe, Taractrocerini.

In recent molecular (DNA) studies the family tree of monocot-feeding skipper butterflies ranks the subfamilies Heteropterinae (mostly South American and some Palaearctic genera), and Trapezitinae (Australian) at the base, followed by the Hesperiinae (throughout the world). This latter subfamily contains nine tribes. The tribe Taractrocerini ('Grass-darts') is derived from the Baorini (the 'Rice-swifts').

Taractrocerines, which include the genus *Ocybadistes,* are found mostly in the Austro-SE Asian countries (with slight [derived] penetration into the Afro-Indian region). They are dominated by diverse genera in Austro-New Guinea. All the species studied (mostly Australian) have larvae that feed on the monocot groups (grasses, sedges, palms, cane-grasses or cordylines [Poaceae]). The adults are typically coloured in shades of orange and brown, with a few patterned on the underside with white or silver markings. The patterns on both sides of the wing of each species, and each sex, are very similar and some species are hard to distinguish without genitalia examination (particularly females). Males can often be separated by the structure of the sexbrand (when present), a set of raised scales on the forewing of the male.

Ocybadistes is characterised by small size, simple hooked antennae (not 'spoon-shaped' as in *Taractrocera*), and usually with an oblique set of dark brands on the forewing of the males. Apart from its size, *Ocybadistes ardea* (Orange Grass-dart) can be distinguished from other species of *Ocybadistes*, by its bright orange colour, and two small parallel dark, sub-oval patches of black scales on the upper side of the male forewing (very hard to see) and by different genitalia (microscope a must!).

Fig. 1

Fig. 3

Fig. 2

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 9

Fig. 8

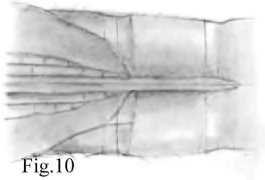

Fig.10

Plate 1 – Juveniles of *Ocybadistes ardea*: egg (lateral and dorsal); 1st instar larva and 4th instar larva (lateral and dorsal); pupa (lateral and dorsal); pupa (frons); section of pupal case (ventral)

The skipper is found in Queensland from the NSW border to Cape York and in New Guinea and adjacent islands, where it frequents sub-tropical to tropical woodlands (Braby, 2000). In the Sunshine Coast the skipper is very local to river and creek systems bordering rainforest, sometimes sharing damp habitats with the taractrocines *Suniana sunias* (C. Felder, 1860) and *Ocybadistes walkeri* Heron, 1894. The adult skipper appears to be confined to at least two broods from January to April, although it has been recorded in all months (Braby, 2000). The latter flight records may apply to northern specimens.

The life history of *O. ardea* has not previously been described.

Description

Food plant: *Oplismenus aemulus* (broad-leafed form), but probably also a narrow leafed form, and probably *O. undulatifolius,* but possibly also *Ottochloa nodosa*. These grasses are often referred to as 'Basket Grasses' or, especially *Oplismenus* 'Bearded Grass' (see illustrations on the front cover).

Egg (front cover and plate 1, figs 1, 2): diam. 0.75mm, dome shaped and smooth, whitish-green at first, then bright red micropyle and central band appear after 36 hours.

First instar (front cover and plate 1, figs 3, 4): length 1.5mm; head shiny black with fine setae, body pale yellowish-green covered with fine setae (longer at posterior).

Fourth instar (plate 1, figs 5, 6) and final instar: length 15-20mm; head roughened with variable mottled brown and pale orange banding.

Pupa (plate 1, figs 7, 8, 9): length 9-12mm; pale yellow, thorax pale brown with thoracic spiracle pinkish-brown, frons dark pinkish-brown with three darker roughened round protuberances; cremaster brown, rhomboid with roughened edges and two posterior projecting spikes; ventral surface near end of wing-cases (Plate 1, fig. 10) with proboscis case elongated to beyond abdominal segment 5.

Observations and Comments

Between 2004 and 2010 several colonies of *Ocybadistes ardea* (Orange Grass-dart) were found close to waterways in summer and early autumn, especially on the Mooloolah and Maroochy river catchment systems.

In these areas the colonies were usually found close to or within rainforest, where individuals usually settled on tussocks, shrubs (plate 2) or on mid-canopy treetops. Females were more commonly found at ground level, perching near prostrate species of Beard or Basket Grass (*Oplimenus*), or on larger grasses and low shrubs, mostly in isolated sunny glades within the forest. Both sexes were capable of extremely rapid flight, quickly reaching the canopy cover when disturbed. Males 'patrolled' the

Plate 2 – *Ocybadistes ardea* in rainforest habitat, Sunshine Coast (female above, 2 males below).

(Illustrations using combined watercolour and gouache techniques)
Andrew Atkins, Eudlo, Feb. 2011

glades and lower canopy for freshly emerged females (they are not known to hill-top). They also aggressively chased much larger butterflies and other insects.

During the late summer of 2009 and 2010, several females of *O. ardea* were also seen in the forests surrounding Buderim. They were carefully investigating prostrate grasses, selecting and eventually laying eggs on the host plants (particularly *Oplismenus aemulus* and *O. undulatiflolius*) growing in the shade where they laid an egg on the upper side or under side of a leaf of the food plant (front cover). Females were also seen at Forest Glen searching large areas of *Ottochloa nodosa*, but oviposition was not observed on this grass, and it is possible *Oplimenus* may have been growing beneath it. Several other butterflies on the Sunshine Coast, including *Suniana sunias*, *Toxidia parvula*, *Toxidia rietmanni* (Hesperiidae), *Hypocysta metirius* and *Heteronympha mirifica* (Nymphalidae), oviposit on these grasses.

Eggs of *O. ardea* are positioned either on the upperside or underside of a mature leaf of the food plant, close to the stem and midrib (see ovipositing female on the front cover). They matured between 9 to 14 days, the ring and central spot of reddish orange appearing after 36 hours on the surface of the pale green egg (plate 1). The emerging larvae ate the egg chorion and moved nearby to make a tubular shelter from the grass-blade, which was stitched together with silk (illustration, front cover). The larvae ate (mostly near the shelter) in the morning or evening, or occasionally at night. As the larvae grew they moved to a more substantial shelter, usually made from both older and dead leaves of the food plant, and placed low on this plant, close to the ground. The final shelters were enlarged to puparіums made from loosely spun leaves of the food plant and litter. They were generally roundish to rhomboid in shape (similar to the puparium of *O. knightorum* [see Atkins, 1996]). The puparium were small and difficult to locate and the pupae were pale and attached by the cremaster with silk at the base. One pupa was only 9mm long (as opposed to those of 15mm for *O. flavovittata* and *O. walkeri* [Jenkinson, 2009]). It hatched from the pupa as a perfect (but small) adult female in about eight or nine days.

Juvenile stages of *O. ardea* are similar to that of *O. knightorum* (Atkins, 1996) though in this species the roughened area on the pupal frons is restricted to a central point (the pupal cap structure and cremaster morphology is generally diagnostic for grass-darts). There are also close similarities to the eggs, larvae and pupae of *O. flavovittata* and *O. walkeri* (see Jenkinson, 2009) and also *Suniana sunias* (see Jenkinson, 2010), but the mature larva of *O. ardea* are smaller and comparatively shorter. The total length of larval stage from eggs laid in mid-March was about 40 days, but the winter brood must last much longer. There may be up to three broods attained in summer to autumn but I have not been able to find larval eating-bites on *Oplismenus* leaves in winter, although some first instar larval shelters were found in spring. No adults have been found in spring or early summer. This suggests that the skipper overwinters (or even early summer) as a young larva, but possibly there is a

brief spring emergence of adults, although this was not observed. More intensive research is needed to investigate the possibility of a prolonged winter to early summer diapause of larva or pupa, and a multi-brood emergence from late January/ early February to April.

The local occurrence of *O. ardea* is also similar to that of *O. knightorum*, but it is more sparsely distributed and across wider areas. The adults of both species generally keep to secluded scattered glades close to their host plants where they bask in sunshine and visit the flowers of nearby Lantana and herbaceous plants.

Some authors (e.g. Braby, 2000) have stated that *O. ardea* is locally common at times, however, on the Sunshine Coast, it is unusual to see more than five or six specimens together at any locality, despite the relative (though scattered) abundance of colonies of Basket Grass. Undoubtedly the skipper once occurred in larger areas throughout the Sunshine Coast before land clearing, sub-division and road building. Several populations appear threatened, however population links (corridors) and possibly a broader choice of food plants in the Mooloolah River and Painter/ Eudlo Creek systems may be sufficient to maintain genetic diversity in the Sunshine Coast region.

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OBITUARY

Murdoch De Baar (1945-2011)

It was with much sadness that we heard in early January of the passing of Murdoch. Murdoch's great passion was entomology and he was renowned as an authority on forest insects and Australian butterflies. Murdoch commenced his career in the mid 1960s as a forest technician for, what was then the Queensland Department of Forestry, which later was merged into Department of Primary Industries (now

DEEDI). In the early days Murdoch was indeed a 'true' field forestry officer, living on forestry stations, most of the stations in relatively remote areas, in what would be considered primitive facilities by today's standards. It was living in these remote areas and under these difficult field conditions that fostered his long-standing interest in entomology and provided him with a depth of entomological knowledge and experience, not just in forest entomology but in many other aspects of the discipline. Much of his knowledge was unavailable in text books; he was a real entomologist and naturalist. In the late 1970s Murdoch and the family were based in Brisbane and he continued as a Forest Technician for the department, based at Indooroopilly, until his retirement in 2006.

While much can be said of his contribution to forest entomology, his knowledge stretched into many other areas of this field, in particular the collection and study of Australian butterflies, moths and beetles, and to these branches of entomology, his contribution should not be understated. A review of the Australian entomology literature gives us at least 25 published papers for Murdoch, including a major generic revision of the Australian *Elodina* (Pieridae), a complex group of small white butterflies. Murdoch was not only a valuable source of information but he gave his information willingly. He had wonderful recall as he had extensive knowledge of the biogeography of the insect fauna of Queensland. He was a 'no nonsense' kind of bloke with little patience for the bureaucracy of the department in which he worked, and was quite outspoken on what seemed to him to be ever increasing departmental layers of management at the expense of science.

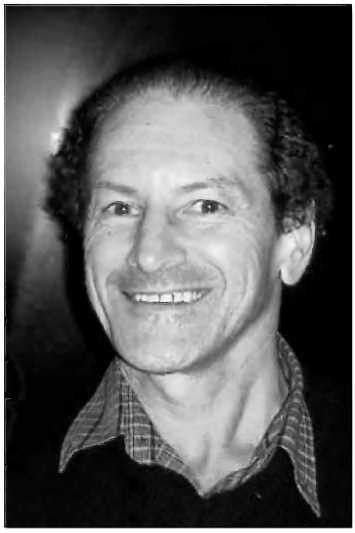

Photo Kerry De Baar

Who was the real Murdoch behind that smile? During the weeks since his passing I have had time to reflect and talk of Murdoch with colleagues. It is their words that I would like to reiterate, which I think comes close to describing who he was. When asked, "What comes to mind when you think of Murdoch?" the words came freely. They were clear and unambiguous. To quote: "always helpful", "courteous", "very amenable", "a true gentleman", "a jolly good bloke", "thoughtful", "softly spoken", "patient", "knows his stuff", "caring", "where did he get his energy from?", "a real character", "very knowledgeable", "ask Murdoch", "a generous man, keen to share and distribute information", "very supportive, a voice of reason". Perhaps his most endearing characteristic was his respect and thoughtfulness for his wife Glenda, for his family and for his friends.

Many years ago, during my early years of knowing Murdoch, he was initially a mentor figure for my blossoming interest in Australian butterflies. Later our relationship changed, as we became friends and colleagues. On a personal note, I will greatly miss him: we relied on each other to bounce ideas around; we spent many weeks collecting together on the islands of Torres Strait; we reviewed each other's manuscripts; we made plans for future collecting trips together (the latest, a trip to Murray Island in Torres Strait was planned to occur over the last two weeks of January); but most importantly we looked forward, after my retirement, to working together on some of the major taxonomic problems within the Crow butterfly group (*Euploea* spp). Unfortunately, now I will have to run solo on that one.

A short anecdote: The location: Dauan Island, in the north of Torres Strait, Queensland. The time: most nights after an exhausting day collecting in the tropics. Each night would go something like this: at around 8.30 Murdoch typically would have an early night, always stating that he was 'buggered' after an exhausting day. We then would all proceed to go to bed. The next morning we would all arise at around 7, and he would immediately start taking insects out of the freezer and processing them. In my curiosity I would ask, "Have you just come back from the jetty collecting insects that came to light?" To this he would casually say "No, I collected these through the night." I would later find out that most nights he collected at the jetty at around 11pm, 2am and at 4am and then proceeded to be out collecting all day.

Dauan Island, Torres Strait, Jan. 2010 – collecting in monsoon rainforest – Photo Trevor Lambkin

The secret: amazing fitness and energy levels and a strong passion for natural history.

He will be greatly missed by his colleagues, professionally and personally, as all who knew him learnt much from him. We consider ourselves blessed to have known him and to have shared knowledge with him.

Trevor A. Lambkin, Brisbane, 9 Feb. 2011

A recent noctuid to Toowoomba, Qld - the Banana Fruit Caterpillar (*Tiracola plagiata*) (Lepidoptera: Noctuidae) - Ron May

The temperate climate of Toowoomba is ideal for growing the plant genus Clivia. This perennial is cultivated extensively throughout the Toowoomba area.

Unfortunately there were two species of Lepidoptera, *Brithys crini* and *Spodoptera picta* that can be destructive pests of plants within the Amaryllidaceae family. Now there are three.

Tiracola plagiata larva on Clivia

Tiracola plagiata pupa

Empty pupal case

In late winter of 2010, while inspecting damage to my Clivia plants, I captured several caterpillars and reared these to adult moths. Different foods were used as an experiment. Clivia, rose, banana skins and capsicum were devoured.

Ted Edwards graciously identified this noctuid as *Tiracola plagiata*, which in Asia is known to have been recorded feeding on 26 different families of host plants. In Australia, it is found from Wollongong NSW north into Queensland.

Photos Ron May

Reference: Common, I.F.B. 1990. *Moths of Australia*. Melbourne University Press.

Editor's note: See *Metamorphosis Australia* No. 55, "The First Record of *Tiracola plagiata* feeding on *Pararistolochia praevenosa*" by Hilton Selvey.

Tiracola plagiata adult

‘Spidiversity’ - **Robert Whyte**, The Gap, Queensland 4061, Australia

Spiders are generalist predators, eating mainly insects and other arthropods. They can tell us a lot about the ecology of the areas they inhabit. Although many spiderlings can balloon great distances into new habitats, they may not survive into adulthood if these new habitats are too harsh or contain insufficient food, and as such spiders have the potential to act as indicator species on a relatively fine scale.

Figure 1. Sampling spiders in Cape Honeysuckle (*Tecomaria capensis*) at Walton Bridge Reserve, Brisbane - Photo Mark Crocker

To weed or not to weed?

In the autumn of 2009, while working with the community group *Save our Waterways Now*, it came time to remove an infestation of Cape Honeysuckle (*Tecomaria capensis*) at Walton Bridge Reserve – a remnant dry rainforest at The Gap, Brisbane. The weed was growing in a dense thicket and seemed to present as a reasonably good habitat for many animals. The question then arose - should the Cape Honeysuckle be removed, or was it acting as important remaining habitat? Before removal I decided to sample the Cape Honeysuckle thicket and compare it with the remnant dry rainforest habitat just next to it.

On average, I found the remnant habitat had about three times as many spider genera as the weedy thicket. In absolute numbers, the remnant also had about five times as many specimens. These preliminary results suggested that at least for spiders, the weedy thicket had substantially lower diversity than the nearby dry rainforest remnant. This was reassuring prior to our weeding efforts at Walton Bridge Reserve, and confirmation of the need to remove invasive species like Cape Honeysuckle.

My next comparison was on a much bigger scale: comparing a 1400 m^2 garden block (at Bromwich Street, The Gap) with 1400 m^2 of dry rainforest (at Walton Bridge Reserve). Both sites were very close to each other and had a similar climate, geology, topography and altitude. In the rainforest remnant there was a large cleared area (i.e. an old camping ground), of similar size to the house on the garden block (see Fig. 2).

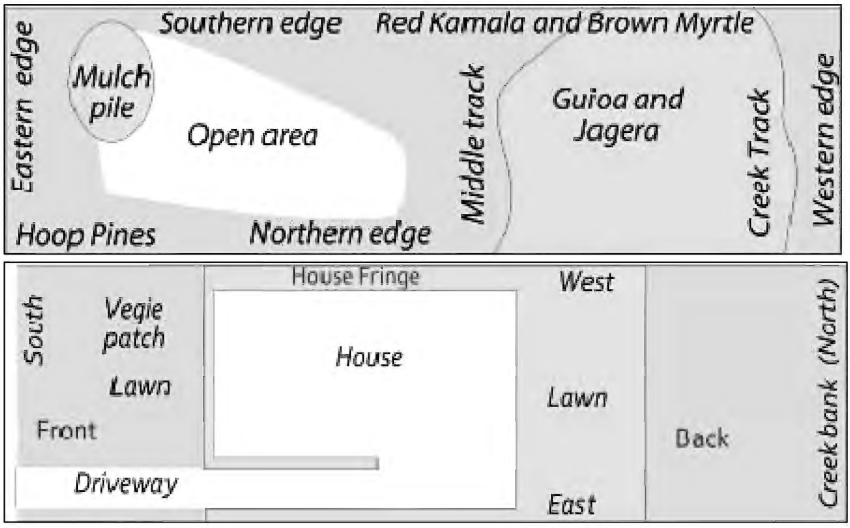

Figure 2. Maps showing the physical layout of surveyed plots at Walton Bridge Reserve (top) and Bromwich Street, The Gap (bottom).

Compared to the garden, the dry rainforest remnant had much more complex and diverse ground and canopy cover. Of the 66 plant species recorded in the rainforest remnant, 57 were locally-native species and nine were exotic. The front section of the garden block had a medium density mixture of traditional ornamental plants, locally native species and a vegetable patch. The northern strip was about two metres wide and had native species with high plant diversity. Behind the house was an open grassed area adjacent to densely-planted local dry rainforest species. Of the 57 plant species in the garden, 36 were locally-native and 21 were exotic.

Results and comparison

Spider abundance and diversity were clearly greater in the dry rainforest remnant than in the garden block, and these data are presented in Tables 1-3.

Species of *Oxyopes* and *Cheiracanthium*, along with some theridiid and salticid taxa (e.g. *Mopsus mormon*), seem very common everywhere in Brisbane and turned up in significant numbers at both locations, whereas the *Eriophora* and *Badumna* species were more common in the garden block than they were in the dry rainforest remnant (see Table 2).

Table 1. Numbers of spider specimens, families, genera and species collected in the dry rainforest and garden blocks.

Dry Rainforest	Garden
932 spiders (5.3 x)	172 spiders
17 families (1.3 x)	13 families
60 genera (2.2 x)	27 genera
96 species (2.7 x)	35 species

Table 2. Numbers of specimens (in parentheses) of the five most abundant spider species collected in the dry rainforest and garden blocks.

Dry Rainforest	Garden
Oxyopes sp. A (93)	*Eriophora* sp. A (21)
Theridion sp. A (51)	*Oxyopes* sp. A (18)
Cheiracanthium sp. A (46)	*Badumna* sp. (14)
Theridion sp. B (39)	*Oxyopes* sp. B (11)
Mopsus mormon (34)	'*Araneus*' sp. A (11)

Table 3. Numbers of specimens (in parentheses) of the five most abundant spider families collected in the dry rainforest and garden blocks.

Dry Rainforest	Garden
Theridiidae (238)	Araneidae (43)
Salticidae (136)	Oxyopidae (39)
Oxyopidae (134)	Salticidae (36)
Thomisidae (118)	Thomisidae (17)
Araneidae (93)	Desidae (14)

A full list of plant and animal taxa collected during this study can be found online at http://sown.com.au/01_cms/details.asp?ID=1988#6325

Indicator species?

These preliminary results (detailed in the online appendices, see above) highlight some interesting questions. I was most interested in whether some spider species might be found more often in remnant habitats and less frequently elsewhere, and if so, whether these taxa could be useful as bio-indicators? The utility of this approach may of course be limited to a fairly small area, and this informal study is highly preliminary, but the observation that a number of spider species were missing from the more degraded urban habitat seemed worth pursuing. In this particular study the strong contenders for potential indicators were *Arkys*, *Chrysso*, *Poecilopachys*, *Tharpyna* and *Thwaitesia.* Of these five genera, *Thwaitesia* (see Fig. 3) seemed the most promising. Indeed, 31 specimens of *Thwaitesia* were found in the dry rainforest remnant, while only one specimen was found in the garden (see Table 4).

Table 4. Numbers of specimens of five possible indicator species collected in the dry rainforest (+/- garden) block/s.

Taxon	Dry Rainforest	Garden
Arkys sp. A	6	0
Chrysso sp. A	4	0
Poecilopachys sp. A	5	0
Tharpyna sp. A	1	0
Thwaitesia sp. A	31	1

Figure 3. *Thwaitesia* spp. (Theridiidae) - Photos Robert Whyte

Thwaitesia is a distinctive and very pretty theridiid genus, with species easy to recognise and reasonably easy to photograph. Due to their reflective abdominal colouration and arboreal nature, specimens are even able to be identified while still immature. Species of *Thwaitesia* appear to exhibit substantial intraspecific variation, but the genus is nonetheless distinctive, even when compared to *Chrysso* and other sympatric theridiid genera.

Conclusions

The observations presented in this article paint a preliminary picture of spider diversity in remnant rainforest habitats in the northern suburbs of Brisbane. While the conclusions are of a very limited scope, the idea that there would be a greater abundance and diversity of taxa in 'better quality habitats' seems reasonable, and having a reliable indicator species would be a great benefit for community bush-care groups. Indeed, the concept of comparing spider abundance and diversity in these forest systems seems worthwhile, if only to engender a greater appreciation of arachnids amongst bush-carers and the general public.

Robert Whyte is an amateur arachnologist in Brisbane, Australia. He is Vice President of Save Our Waterways Now*, based in the Enoggera Creek Catchment. This article was first published in* Australasian Arachnology *(Issue 80, August 2010), and appears here in modified form.*

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The Zodiac Files…the cycle begins – Maya Harrison

Editor's note : Maya began this account in the June 2010 issue of the magazine.

Day 1…
Mid-morning April 6 2009, I was fortunate to see a Zodiac Moth (*Alcides metaurus)* laying eggs on the leaf of a Tree Omphalea (*Omphalea celata*) in the Mackay Regional Botanic Gardens. The eggs were laid in a cluster and were cream in colour. Alas, I did not have a camera with me to capture this action. The eggs were collected and then photographed (in the office) immediately after the moth finished laying them. Fig.1


Fig.1

Day 2…
The following day, the eggs were pinkish in colour. The close up photography shows the ridges on the eggs surface. A red circumferential line within the eggs is clearly visible. The pole ends of the eggs also have a reddish dot. Figs. 2 and 3


Fig.2


Fig.3

Day 3…
The eggs remain unhatched and are still pink in colour.

Day 4…
In the photo you can see a few small 1 cm caterpillars walking over the leaf, but these are from another clutch of eggs that I will mention later. The caterpillars move very quickly. Fig. 4

Day 5…
Around noon, I noticed that the eggs have turned a greyish hue. Are they close to hatching? Fig. 5

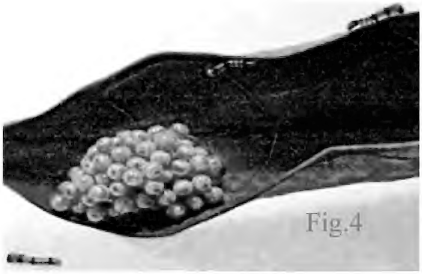
Fig.4


Fig.5

That evening around 10pm, the caterpillars emerged from their eggs…4 ½ days after being laid. Why do eggs, so far observed, hatch at night? Under the cover of darkness are they safe from predators perhaps? Fig. 6

The half spheres of the hatched eggshells are clearly evident too, the flattened base of the shell being attached to the leaf. The eggshells do not seem to be eaten, but rather the top half of the eggshell has been lifted or popped off. Fig. 7

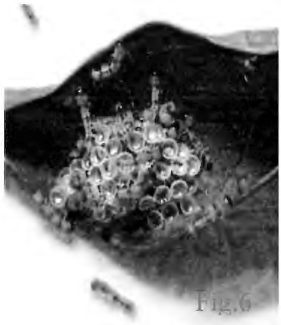
Fig.6


Fig.7

It seems all the eggs have hatched… The caterpillars congregate under the leaves to eat, not mattering if it is really the true underside, and the result of all that eating is evident in the shadow of excrement near the leaf. Fig. 8

The caterpillars, a few days older, certainly devastate a leaf, eating more than just the top layer of the leaf. Fig. 9


8


Fig. 9

Let me back track a little to another clutch of eggs…

Around 10am April 8 2009 (Day 3), another clutch of eggs was found on a leaf in the Gardens in the same group of Tree Omphaleas.

These eggs comprised of cream, pink and grey eggs. It made me wonder if the eggs had been laid at different times and whether one moth had laid all the eggs or had more than one moth deposited their eggs in the same place. Can eggs develop at different rates even when laid at the same time? The eggs certainly looked like they were laid all together. Fig. 10

Caterpillars emerged the following day. (Day 4) The photograph shows only the darker hued eggs have hatched. The pink and cream ones remain unhatched and from the earlier part of the 'files', I now know that this is because they are less mature. Fig. 11

As the caterpillars grew, they seemed to look all the same, which made me think that a clutch of eggs produced the same colour variation. However as time went on, differences started to be seen. Figs. 12 and 13

Alas, my discoveries came to an end when the trees leaves were sprayed to control the caterpillars in the Gardens. I was unaware of this and fed my caterpillars these leaves and thus killed my entire population!

2010…

But new seasons come around and in 2010 my observations have included … Observing and photographing moths mating… Some have been observed to stay conjoined for many hours (in the Gardens…all day and in captivity over 24 hours).


Fig. 14

Fig. 14

Moths, in captivity have been seen to lay eggs within the next 12 hours after mating. These eggs hatch in the same time frame… 4 – 5 days and go through the same colour changes.

Eggs are laid in all sorts of places, sometimes on leaves, twigs, brown pine needles that have fallen from nearby trees and are caught amongst the leaves of the Tree Omphalea, and on web threads between leaves and branches. Sometimes they are in large clusters of over 25 eggs and other times just a single, couple or 1-5 eggs are laid. I suspect that the moth may be disturbed when laying only a few. In captivity the eggs have been laid on leaves, and all over the surfaces of the containers.


Fig. 15

I have noticed recently that some moths have laid greenish yellow eggs in captivity but these have not hatched or changed colour in any way, possibly being infertile.

I have raised a clutch of eggs to adults and the colours of the caterpillars had little variation, more the pattern than the colours. I wish to hatch and raise more egg clutches before I will say with any certainty that a moth lays eggs that produce similar colour variation of caterpillars in contrast to a clutch of eggs producing a wide range of caterpillar colours. Fig. 15

I continue to be amazed at the different colour variations seen in the caterpillars and still wonder why this is so… and this season there have been some new colours and patterns.

I have also noticed a colour variation in a few of the adult moths showing a distinctive blue tinge to both surfaces of their wings.

Last year, 2010, there did not seem to be a wintering period like the previous year, and with the warmer weather and post cyclone changes, August, December and February saw the Omphalea Trees totally devoid of leaves as the population of caterpillars increased significantly. Not a leaf on any of the trees… not a good look for the Botanic Gardens. Once again the caterpillars made cocoons in adjacent plants in which to pupate.

Having just hatched eggs laid by captive moths, I now look forward to seeing the colours variations (if any) of the caterpillars as they mature.

Photos Maya Harrison

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Life history notes on the No-brand Grass-dart, *Taractrocera ina* (Waterhouse, 1932) Lepidoptera: Hesperiidae - Wesley Jenkinson

This small butterfly, also known as the Ina Grass-dart, mainly occurs along much of the coastal and sub coastal regions of Queensland. The species is relatively common but localised and is found amongst grasses in eucalypt open-forest (Common and Waterhouse 1981) and open woodland. The adults visit and will breed in suburban gardens in Southeast Queensland providing suitable habitat and host grass is established nearby (or is growing as weeds in unmown lawns). Several exotic grasses are known as hosts, however the native hosts (if any are known) remain unpublished. At Beaudesert in Southeast Queensland I have found eggs and larvae on a known exotic host, Lemon Grass (*Cymbopogon citrata*) (Common and Waterhouse 1981) and recently in 2009 I confirmed larvae found feeding naturally on exotic Paspalum Grass (*Paspalum dilatatum*) (Wesley Jenkinson, in Moss 2010).

Like many of Queensland's small sized grass-darts the adults can be difficult to separate. In comparison with other grass-darts in the *Suniana* and *Ocybadistes* genera the *Taractrocera* genus have more flattened and rounded (spoon shaped) antennal clubs. The sexes can also be tricky to identify with the males having no forewing

sex brand. The females have slightly more rounded wing termens and wider abdomens compared to males.

Within Queensland, individual specimens vary minimally in the extent and intensity of the orange markings but the underside occasionally has a greenish tinge.

Wingspans for the pictured adult specimens are males 24mm and females 25mm.

***Taractrocera ina* (No-brand Grass-dart)**
Images left to right: male, female, male underside, female underside

Adults have the typical erratic rapid 'skipper' flight and frequently settle on grass or low-lying vegetation to bask in sunshine. The males are territorial and can be observed in swift chases with other males, often returning to settle on the same perches. The adults of both sexes are readily attracted to a wide range of small native and exotic flowers.

During a hot day in January at Beaudesert, a female was observed briefly landing on the upperside of a host grass leaf in dappled sunlight. She then walked, with the wings closed, around the leaf margin to the underside of the leaf and laid a single egg. A short distance was then flown and she again settled on the upperside of another grass leaf to rest.

The eggs are dome shaped, approximately 1.0 mm wide x 0.6 mm high, smooth, white when laid but changing to creamy-white after two days.

←Freshly laid egg

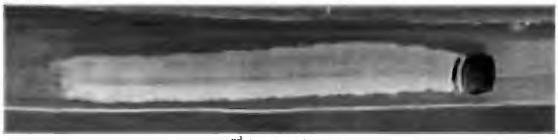
The egg was collected and was raised in captivity to an adult on *Paspalum dilatatum*. The tiny larva consumed the eggshell shortly afterward emergence. Later it proceeded to form a cylindrical shelter near a leaf tip of the host plant. Making small transverse cuts from the outer leaf edge towards the midrib, it then curled the leaf margin inwards using silk to form the shelter. Later, when feeding occurred, the leaf was eaten from both sides of the margin and stopped at the leaf midrib. This caused the cylindrical shelter to hang (similar habit described in Braby 2000). Several silk lined shelters were created throughout the larval duration and typically the larva emerged at

dusk to feed. The final shelter created initially measured 200 mm in length. The fifth instar remained in the final shelter and before pupation it stitched the posterior end of the shelter closed leaving a small opening remaining at the anterior end (the adult emergence hole).

The larva completed five instars and attained an approximate length of 25 mm.

1st instar larva

2nd instar larva



3rd instar larva

4th instar larva

5th instar larva

The pupa measuring 16mm in length was located loosely in the final shelter and was very finely covered in a white waxy powder.

Pupa – dorsal view

Pupa – lateral view

An egg laid on 23rd January 2009 hatched in 3 days. The larval duration was 41 days and pupal duration 8 days. The adult emerged in March, 52 days after oviposition.

Within the new boundary of the Scenic Rim Regional Shire south of Brisbane, I have records of the adults during the hotter months from October to March. At this locality there are probably two generations completed during the year.

So next time you are in the garden, spend some time looking for this fine species as it may be present!

Photos Wesley Jenkinson

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NEW HOST PLANT RECORD

Two new host plants for the Evening Brown butterfly (*Melanitis leda*) - Ross Kendall

Evening Brown (*Melanitis leda*) larva

On 15th January 2011, Frank Jordan and Helen Schwencke found larvae of the Evening Brown butterfly feeding on Barbed Wire Grass (*Cymbopogon refractus*) in Helen's garden at West End. The caterpillar was kept. It pupated and emerged. This record was further confirmed when members of BOIC made similar observations on February 5th at Fox Gully, Upper Mount Gravatt.

On that same visit, Graham McDonald observed, and called our attention to, another new record. This time it was of larvae of the same butterfly feeding on Small- flowered Finger Grass (*Digitaria parviflora*).

Photo Ross Kendall

"Spider Silk" by Leslie Brunetta and Catherine L Craig – reviewed by **Densey Clyne**

It is a tropical summer day back in 1978 and Jim Frazier and I are searching a mossy roadside bank for signs of a very remarkable spider. We have followed explicit directions to this exact spot on the island of Penang in Malaysia in order to film the spider for a BBC documentary.

Jim is the first to locate the spider's trapdoor, well camouflaged but recognisable by the radiating silk trip-lines. It could easily belong to one of our Australian trapdoor spiders, especially when the spider shows its face with its downward-pointing chelicerae. Only later, when we persuade *Liphistius desultor* to come right out of its burrow and face the camera, do we understand why this spider and its close relatives are known as 'living fossils'.

Reading the book "Spider Silk" for this review I have learned a great deal more about *Liphistius desultor* and the place of this spider and its relatives in the hierarchy of spider evolution. But that is just the beginning. The authors go on to tell an absorbing story of how silk and the equipment for spinning it have brought the spiders along the 'Silk Road' from ancient times to the present day.

Early chapters of the book deal with the fossil history of spiders. A specific lineage is described that reaches back millions of years and includes *L. desultor* and its antecedents. It seems that the living spider was first discovered in 1849 on the very island of Penang where we filmed its descendent over a hundred years later. In spite of observable differences it was then tentatively classified with modern trapdoors, funnelwebs and 'tarantulas' as a Mygalomorph. However, examination of specimens collected later confirmed two unusual things about these spiders:

1. Unlike the spiders we're most familiar with they have segmented abdomens, rather like insects and probably similar to the earliest spiders.

2. The silk-producing spinnerets lie beneath and in the middle of the abdomen, instead of at the tip as in present-day spiders.

The same characteristics were seen in a fossilised spider found in 1890 and dating back 290 million years, so here was further evidence of the long lineage of these 'living fossils'.

Around 90 relatives of *L. desultor* have now been identified, in five genera, all living in regions of China, Japan and S.E. Asia. Because of their similarity to each other, the five genera are placed in one family, the Liphistiidae, and given their own suborder, the Mesothele ("middle teat", named for the teat-like appearance of all spider spinnerets).

These spiders use silk in a limited way, to line burrows, make trapdoor lids and protect eggs. Over millions of years they have hardly changed their body shape and presumably their method of prey capture. This is done without rising far above the level of their burrow entrances, and without venom. Yet they have survived all the environmental changes since the first spiders captured the first insects so many millions of years ago.

From there on it all hangs, you might say, on a silk thread. That silk thread is followed by the authors of this book, from its simple early use to the many and varied fabrics, structures, traps, weapons, lifelines and life styles of modern spiders.

Appearing later in the fossil record is the other suborder of spiders, the Opisthothele ("posterior teat") containing the two groups of spiders most familiar to us. These are the Mygalomorphs, and the Araneomorphs which include all other modern families including the web-makers. We learn from the authors that the earliest Mygalomorph fossil dates back to a time when insects were proliferating, together with the plants that sustained them. Some insects were already airborne, and many were predators. A spider in the open could be at risk, and even today most Mygalomorphs stay prudently underground. From their burrows they use their silk for prey detection not for prey capture, but unlike the Mesotheles they use venom to kill their victims.

However, some Mygalomorphs have ventured above the ground, using house extensions to take them a little way into the three-dimensional world of their insect prey. By adding collars and turrets to the silk tube lining the burrow, they extend the area of prey detection upward a short distance. The authors' examples of Mygalomorphs' adaptive use of silk include our Sydney Funnelweb's sheet-web extension beyond its silk-lined crevice. A few spiders attach such extensions to a tree trunk or plant stem; a well-known Australian example is *Misgolas robertsii* that can extend its camouflaged tube 30 cm or more up from the burrow.

Modern spiders have evolved at least six different kinds of silk but we learn that the big breakthrough came with the development of *major ampullate* or dragline silk. It was largely this special silk that took spiders up into the air, diversified their lives and behaviour and gave rise to the Araneomorphs. Today these comprise 38,000 species worldwide, hugely outnumbering the other spiders.

One of the toughest materials on earth, this dragline silk is used by the Araneomorph spiders in a variety of ways. It forms the security line the spiders pay out behind them wherever they go; it enables spiders to rappel to safety and it gives them new freedom in a three dimensional world. It can even give them flight - a fine thread of this silk will lift tiny spiderlings into the air and take them to new destinations. Even some adult spiders have been seen to hang-glide in this way.

The same kind of silk forms the thread that an orb-weaving spider lets out, to catch the breeze, float across a space and form the first bridging line for its aerial web. Reinforced during web construction, this surprisingly strong support cable can hold the weight of the giant orb web of a Nephila spider and its contents, and even withstand the violent struggles of large insect victims. No wonder birds steal such webs to bind their nest materials together. Perhaps because we so often run into the vertical orb webs in our gardens, or admire them bejewelled with dew, we humans see orb webs as the ultimate in spider ingenuity and creativity. But there are many different types of web just as successful in prey capture - if not quite so 'artistic' to our eyes!

Araneomorph spiders use different kinds of silk for many different purposes, often specific. Many use it for wrapping and immobilising their prey after capture. Most importantly, silk is vital to the activities of mating and reproduction. The male spider uses it to weave the tiny web on which he deposits his sperm, his first act in a complex mating game. The same basic silk is used by a female to weave her egg sac, which may start with a soft swaddling and progress layer after layer to a tough, beak-proof covering.

Then there is the special use of silk by the renegades, those former web-makers that have opted out of web-making altogether. The authors cite as an example the female Bolas spider who uses only a single thread of sticky silk to catch her dinner. By mimicking the sex scent of a female moth the spider lures the male moth of the same species to her ambush spot. As the male approaches the spider swings her sticky thread, hits the moth amidships and hauls her catch up to her lair. She may store him for future consumption and cast out another line. Among spiders there are many such amazing tricksters.

For me the story of spiders and their diverse use of silk is one of the most fascinating in the natural world and this review could go on for much longer, but space constrains me. I have only briefly touched on some of the staging posts along the spiders' Silk Road so ably and comprehensively mapped out for us by the authors. For the non-scientist there are a few areas in the book dealing with the genetics and chemistry that need concentration. But with its essentially readable text (and welcome flashes of humour) the book contains a wealth of fascinating information. It certainly filled a lot of gaps in my own knowledge.

For anyone who has an interest in spiders and their silken thread of life "Spider Silk" is essential reading. I recommend it to all you keen arachnophiles who have read this review!

The book is available from CSIRO Publishing for $39.95 plus postage.

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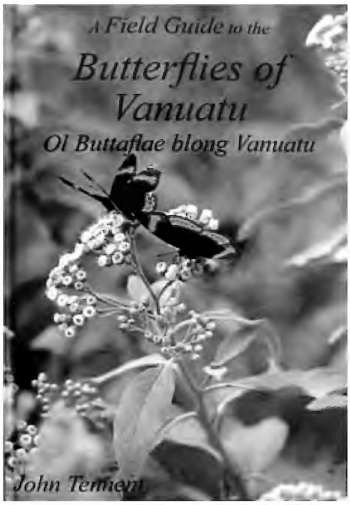

A Field Guide to the Butterflies of Vanuatu by John Tennent
– reviewed by **Kelvyn L. Dunn**

Publisher: *Storm Entomological Publications, England, 2009*
192 pages. ISBN 978-0-9542045-1-8. Price £44 GBP
Available from the author
Email: jtstorment@gmail.com

It was a pleasure to purchase this guide to the butterflies of Vanuatu, particularly as I have a moderate familiarity with the local species and a desire to return one day. With stands of secondary forests so close to villages and with rainforest covering 75% of the country, butterflies are still afforded plenty of habitat. I found 44 species (about 64% of the fauna) in just 11 days on three major islands (Espiritu Santo, Efate and Tanna). Back then, in February 2004, a published checklist (dating from the 1980s) and some black and white photocopied plates from general works on the greater Pacific region (which soon became sweat-soiled in the torrid conditions) guided me in my search. But, had I had this new field guide tucked in my daypack – the handiwork of an Englishman, W. John Tennent – I may have recognised even more!

The southwest Pacific includes an interesting and largely unexplored component of the butterfly fauna of the Australasian region. This new piece fills a gap in the butterfly knowledge of the New Hebrides archipelago (mapped on p.11), and reveals the fauna's close links to that of other neighbouring islands, including Australia (regional map on p.10). Located about 2,000 kilometres northeast of Brisbane (and 800 kilometres west of Fiji), Vanuatu comprises a chain of hundreds of islands, islets and atolls that extend roughly north-south for some 1,600 kilometres. Many islands are low in elevation, but some are mountainous and the highest peak on one of the larger islands, Espirtu Santo, reaches 1,879m. I found that there was little in the way of roads or infrastructure beyond the main areas of settlement on Espirtu Santo, and Tennent reports that this is the norm

on many islands. This remoteness has meant that some 80 years have now passed since the first and only males of one inhabitant subspecies, the Vanuatu Jezebel (*Delias nysa santo*) were collected. Indeed, the female still awaits discovery in that island's remote and rugged interior.

The Preface explains that this field guide arose from Tennent's earlier, and now well-known work in the Solomon Islands when the fauna of the Santa Cruz group (politically part of the Solomon's) was compared with the Torres Group (which comprises the northern islands of Vanuatu). Geographic overlap led to a wider survey of the country's butterflies, conducted on behalf of the Vanuatu government, and added to the list of fauna which now stands at 70 species (p.15) and 79 species for the broader archipelago (p.19). Although there are no endemic genera in Vanuatu (p.21), about 9% of butterfly species in the New Hebrides archpelago are strictly endemic (p.19), and within this region at least one species, *Polyura sacco*, is currently unknown beyond Vanuatu. Tennent is more than qualified to have authored this latest field guide: he has spent seven months in Vanuatu (in 2000 and 2002) and visited 20 of the islands (some several times each). His earlier relevant works include a preliminary checklist of the butterflies of Vanuatu (in 2004), which was part of a broader paper on their biogeography, and a huge checklist (over 200pp.) of the butterflies of Melanesia, Micronesia, Polynesia, and some adjacent areas in the Pacific region (2006). On top of this, he has published over 200 papers and two books on butterflies, which leaves me suitably impressed – even spellbound!

This A5 sized, hardbound work of 192 pages, interspersed with island scenery and pictures of quaint villages to pique readers' interest, is described as both a scientific endeavour and an educative piece intended for school libraries in Vanuatu. Concerning the latter, the Acknowledgments state that it was his late wife, Julie, whose idea it was that gratis copies of the book be presented to each of the 650 schools in Vanuatu, which adds a heart-warming touch of beneficence to this production. The Introduction overviews the geography and climate of Vanuatu, and a short section on biogeography enlightens readers as to the likely origins of the fauna and distinguishes several faunal demarcations within the broader archipelago (mapped on p.17). This is followed by a brief history of butterfly research in the country, an overview of the butterfly life cycle and morphology (including venation and wing space notation) and a three-page glossary, which will equip the newly acquainted with the fundamentals. An account of each species and subspecies obviously forms the bulk of the guide, and supplementary to this is an illustrated shortlist of species that are not reliably confirmed or which are considered erroneously recorded from Vanuatu. Their inclusion (rather than exclusion) is to encourage observers to keep watch for them just in case they turn up. The book closes with eleven pages of references, an index of species names, and nine blank pages intended for users' personal field notes.

The species accounts, which emphasise common names in both Bislama and English, enable readers to learn about the butterflies and how to recognise them when seen. These provide the worldwide range of each species with special focus on the broader Pacific region, and list all islands in Vanuatu from which each taxon has been reliably reported. Importantly for the field naturalist, it includes colour illustrations of all species and most subspecies based on locally caught material. Presented life-sized or larger, they include both sexes and wing surfaces for the majority of species, and a selection of adults is presented where there is significant variation within populations. This is vital as some islands have their own local forms, which means that populations may differ visually between island groups and broader regions. One polymorphic species, the Common Eggfly (*Hypolimnas bolina*) is richly illustrated (pp. 133-136); twenty-seven (27) adults show the variation one might expect to see. The author lists any similar looking species where appropriate and includes other information, such as individual species' favoured habitats, distinguishing features of flight and particular behaviours that can help with identifications in the field. Yet some species cannot be separated easily by visual inspections, which the author explains. He reminds readers that even butterfly scholars remain uncertain on the identifications of a few groups (or subspecies) in the region; the *Jamides bochus* group, whose members glisten like blue gems as they patrol and perch against a backdrop of dark foliage, is one example. The work is clearly a starting point for this archipelago and so focuses on the adult stage. Indeed, the life histories and food plants utilised in Vanuatu are largely unknown, and so knowledge gained elsewhere in the Pacific, particularly from Australia, serves as a guide as to what plants might be utilised locally. Butterfly enthusiasts can now begin to fill these gaps by seeking out, rearing and photographing the early stages and, where possible, obtaining identifications of any plants utilised by the caterpillars.

To balance the positives though, a few deficiencies need commentary. Pleasingly, there are very few typographical errors – evidently the work has been carefully checked – but one requires mention as it concerns a scientific name; the taxon *Catochrysops* is misspelled on p.83. Ambiguity arises as to which specimen photographed on page 102 is the one from Indonesia; the caption indicates it is the male whereas the text specifies the female. Most of the broad distributions provided for species seem accurate, but the extensive occurrence of *Pelopidas lyelli* in northern Australia was overlooked. The list of 'References and Bibliography' (162 entries), although extensive for a work of this brevity, is incomplete as several sources cited in the text are omitted (see examples pertaining to larval host plants on pp. 69, 84, 86, 88, 114, 123, 124 etc). Elimination of blank pages between sections and the use of twin columns for the species index may have enhanced the layout. Of more concern, though, is the flaw in the collation of the work which occurred during the printing process; pages 41-46 (dealing with the Hesperiidae) are misplaced sequentially in all copies; they follow page 154 after which paging continues from 155. The section was inadvertently transposed after proofs were checked.

The taxonomy is up to date, but the author has chosen to revert the taxon *gorgophone* to a subspecies of *Catopsilia scylla* (p.54). In advancing this option he mistakenly states that Braby (2000) and Edwards *et al*. (2001) in the *Zoological Catalogue of Australia*, had recently given it species status over the historical alternative. In fact McCubbin (1971) was the last to retain the arrangement of Waterhouse (1932). Thereafter Common and Waterhouse (1972 & 1981) treated it as a distinct species (rightly or wrongly), not as a race (or subspecies) as the guide suggests they did; hence all Australian authors since 1972 have accepted *gorgophone* as a discrete species. I know of no published or reliable evidence of any *etesia-like* stock (the form of *scylla* in Australia) having arisen from bred material of pure *gorgophone* in southeastern Australia. I once subjected pupae of *gorgophone* from southeastern Queensland to three temperature regimes and produced no changes in adult phenotypes that might suggest seasonal variation within a broader species (Dunn 1995), but trials using later instar larvae need to be done to adequately test for any seasonal influences. Moreover, the presence of a black spot at the end of the forewing cell (which is visible in the Vanuatu specimens illustrated) is not decisive alone as it is subject to variation among both taxa in Australia, and needs consideration alongside other characteristics. I think that the pair illustrated from Vanuatu falls within the variation known in *C. scylla etesia* in northern Queensland, and so it is closer in appearance to the latter rather than to *gorgophone*. If *gorgophone* is conspecific with *scylla* (as supposed in this treatment) then material from Vanuatu was more likely derived from ancient emigrants from the broader Australian region (those being ssp. *etesia*) rather than directly from Indonesia (nominate *scylla*). The position of *gorgophone* as a legitimate taxon remains unclear as Braby (2000) discussed. Genetic appraisal of various populations and/or rigorously controlled breeding experiments may resolve its origin and taxonomic status in the future.

The provisional placement of *Junonia villida* as an extension of the nominate subspecies I also query. The adult illustrated does not, and the many I have seen in Vanuatu did not, appear noticeably different from those I encountered in Papua New Guinea, The Solomon Islands, New Caledonia, Fiji and Tonga, as well as those seen throughout Australia. Adults of the nominate *villida* I saw (and photographed) in Samoa appeared, in general, to be more extensively orange-ringed and, based on that characteristic, seemed to be a local form of the butterfly within its broader range. I have not seen examples similar to these elsewhere in my travels, and I believe I could separate some or perhaps all of the adults I encountered in Samoa (on Savaii & Upolu) without reference to locality if the need arose. Essentially, the female illustrated from Ambrym seems indistinguishable from typical wet season examples from coastal Queensland (in my opinion), so perhaps the Vanuatu population belongs with subspecies *calybe* instead. Tennent mentions though that some authors recognise no subspecies at all for this wide-ranging butterfly!

This faunal guide will prove an indispensable companion to those who wish to learn about the local butterflies, discover additional species, record new distributions on the hundreds of unsurveyed islets and atolls, or document the larval food plants. Many of the larger species are widespread so the guide will serve usefully for neighbouring countries too (such as New Caledonia, Fiji, Tonga, Samoa, Niue etc), at least until illustrated works on their own local and often discrete faunas become available. Its slim size enables portability and the hard cover will buffer wear and tear in a daypack. The few flaws exposed are very minor concerns, and the taxonomic quibbles I have expanded upon are personal opinions (others may care to disagree with these and are entitled to do so). My last thoughts concern how easily such a vital book as this one could be replaced if it were to be lost during fieldwork – available stock is limited!

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Appendix:

Fig. 2

Samoa is the type locality of the Meadow Argus (*Junonia villida*). Figure 1 shows a male of the nominate subspecies photographed at Papasee'a Sliding Rock, Upolu Island, Samoa in Feb 2003. The more extensive orange rings are prominent among adults on this island and on Savaii. Comparison of this adult and examples of the species from Pacific nations further west, including Vanuatu, suggest that the latter are more similar to Australian stock. The second male photographed at Beaconsfield, Victoria (Figure 2) in Jan 2009, is typical of subspecies *calybe* in Australia.

Photos Kelvyn Dunn

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2011 Australasian Invertebrate Conference – Skye Blackburn

After the great success of the 2009 Australasian Butterfly Breeders and Enthusiasts Conference which was held in Sydney, we have decided to expand our conference to include other invertebrates as well! The 2011 Australasian Invertebrate Conference will be held in 2 parts. The 28th and 29th June will be aimed at butterfly breeders and enthusiasts. This portion of the conference will be held at the Melbourne Zoo and will include topics such as butterfly disease control, husbandry, conservation, education and the national butterfly tagging project. The second part of the conference will be the 30th June and the 1st July and will be held at the Melbourne Museum. These two days will cater for other invertebrate breeders and enthusiasts and will include topics in sexual selection, macro photography and pest control. Both the butterfly and invertebrates portion of the conference will be of interest to breeders, educators, exhibitors, conservationists and general hobbyists. To register for this event, please email Skye contact@butterflyskye.com.au Full registration website with conference schedule will be available very soon.

FROM A CORINDA GARDEN

Editor's comment: In 2009 Murdoch De Baar began putting together a series of short articles on insects in his garden which he humbly suggested I could use as "fillers", when needed, in the magazine. The following is one of these articles entitled**:**

Camouflaged Insects - Murdoch De Baar

I have put together a series of Brisbane garden articles to illustrate that it is not always necessary to go on long excursions to uncover interesting insect observations, and follow a number of BOIC members who have already illustrated interesting garden insect discoveries.

In this article of seven photographs from my Corinda garden, I have tried to capture the difficulty of finding some insects and the camouflages they rely on.

A question that might be asked by the non-entomological observer is "How do the mates of these hard-to-find insects ever meet, if we can't even see them?" For all these illustrated insects except the Yellow Admiral, this is their day cover. The Evening Browns become active at dusk. When searching for a mate however, insects can use pheromones, a range of sounds, a range of colours and refractions, certain sequence of movements, specific meeting locations (top of tree, top of hill, certain plant foliage, just after a storm, etc.). The colour-range vision of some butterflies can be beyond ours, into the ultra-violets or the other extreme, and colour shifts by way of complex scales are also used. Many dragonflies have clear wings, but reflect colours as they fly past the observer. These colours can be used to attract mates, confuse their outline, camouflage themselves or put fear into predators.

Fig. 1. Fruit Piercing Moth, *Eudocima fullonia* (Clerck), fam. Noctuidae

Fig. 2. Bladder Cicada, *Cystosoma saundersii* Westwood, fam. Cicadidae

Fig. 3. The hawk moth, *Psilogramma menephron* (Cramer), fam. Sphingidae

Figs. 4 and 5. Evening Brown, *Melanitis leda bankia* (Fabricius), fam. Nymphalidae

Fig. 6. A moth larva, fam. Noctuidae, is camouflaged on a Pink Powderpuff shrub *Calliandra* sp. stem. A second stem shows feeding damage to the bark.

Fig. 7. Yellow Admiral, *Vanessa itea* (Fabricius), fam. Nymphalidae, hides on a eucalypt stem (along with orchid roots)

Photos Murdoch De Baar

EXCURSION REPORT

Fox Gully Bushcare Restoration - Saturday 5th February 2011

– Helen Schwencke

Brisbane has many great well-kept secret bushland locations to delight those of us on the lookout for some of the fascinating invertebrates to be found there. Fox Gully proved to be one of these. On Saturday morning 5th February a group of us were led through a bush restoration project undertaken by the Mt Gravatt Environment Group. Thanks go to Michael Fox, President, and Sue Jones for organising this activity.

Butterfly Club members have long had a reputation of being very slow walkers, mostly we want to examine every leaf and twig, especially if someone has found something. This excursion lived up to this reputation. I'm not sure Michael managed to actually show us everything he intended, but I'm sure we all thoroughly enjoyed what we did see. While the site is divided up into various restoration zones which Michael had hoped to show us, I experienced the excursion from host plant to host plant, observation to observation.

One of the highlights Michael did manage to show us was a lawn comprising closely mown Bearded Grass (*Oplismenus aemulus*). This very pretty grass is a host for the Wonder Brown (*Heteronympha mirifica*), though this species is not usually found in Brisbane. Using a native grass helps prevent the invasion of Brisbane's bushland by invasive exotic lawn grasses.

A Soursop just at the entrance to the restoration site showed an empty chrysalis and the evidence it had been used by Pale Triangles (*Graphium eurypylus*).

Theretra clotho larva – Photo Ross Kendall

Our first port of call was a well chewed Slender Grapevine (*Cayratia clematidea*). This was being consumed by a number of various sized green Hawk moth larvae (*Theretra clotho*). At various times excursion members saw Joseph's Coat moths (*Agarista agricola*) flying around. One lucky participant, Graham, even managed to find a caterpillar. I also saw some beetles, *Oides dorsosignata*, whose larvae I had previously raised on this plant. Both the larvae and adult beetles eat this plant.

Small Green-banded Blue larva – Photo Ross Kendall

Many of the Soap Trees (*Alphitonia excelsa*) showed extensive chewing by Small Green-banded Blue caterpillars. Their distinctive skeletonising chewing patterns make the larvae easy to find on the rare occasions when they are present.

The Black Wattle (*Acacia concurrens*) had some spectacular Prominent Moth (Family: NOTODONIDAE) larvae (*Neola semiaurata*) eating them. These creatures have such an interesting back end with a blue and black spot that opens wide if disturbed, looking like an eye. Having disturbed two of the larvae, I noticed the branched osmeteria under their heads.

Neola semiaurata larva

Further along the walk full-grown Evening Brown larvae (*Melanitis leda*) were found on Barbed Wire Grass (*Cymbopogon refractus*). I had also found a caterpillar of this butterfly feeding on this grass in my backyard a few weeks before the excursion. Several of these butterflies were disturbed into flight by our excursioners.

The numerous Poison Peach (*Trema tomentosa*) bushes were also showing signs of being considered very palatable. At times along the way Speckled Line-blue (*Catopyrops florinda*) butterflies were observed flying around a plant, and at others larvae were found. Larvae of a Geometrid moth were also found. A remarkably similar caterpillar illustrated on Don Herbison-Evan's Australia's Caterpillars website (lepidoptera.butterflyhouse.com.au/) is named *Pingasa chlora*. This site indicates that these larvae have been found on Poison Peach. These caterpillars have a remarkable capacity to camouflage themselves as small twigs.

Sadly the Imperial Hairstreaks (*Jalmenus evagoras*) eluded us. No ants that attend the caterpillars and chrysalises of this species were located at this time. It's possible that the species is in the egg phase of its lifecycle. There were several known sites for this butterfly, but unfortunately we only had time to look at one.

Every time I find *Smilax australis* I examine it closely for ants in the vain hopes of finding Bright Forest-blue larvae (*Pseudodipsas cephenes*). Alas, once again, I didn't find them. This plant is also host to a beetle species. There was evidence of the beetle larvae having used the plant. Unfortunately I've not managed to raise these through to be identified yet.

A nearly full grown Leafwing caterpillar (*Doleschallia bisaltide*) was photographed on some Love Flower (*Pseuderanthemum variabile*). A lovely photo of the creature can be found on the Fox Gully Bushcare blog: foxgully.wordpress.com/
Along the way we encountered a healthy Bearded Dragon and heard a Whip Bird calling in the distance. A rich invertebrate fauna is essential to a healthy ecology. After the necessary food plants, invertebrates comprise the lower part of the food web.

Other observations included:

- a wasp-mimicing hover fly. Unfortunately this flew away too quickly to take a photograph.
- The Cheesewood trees (*Glochidion sumatranum*) had a scattering of the delightfully lobed case moth larvae cases.
- Splendid Ochres (*Trapezites symmomus*) were spotted flying around, though only older chew marks were found on the *Lomandra* spp. plants examined.
- White-banded Planes (*Phaedyma sherpherdi*), Orange Ringlets (*Hypocysta adiante*), Brown Ringlets (*Hypocysta metirius*) and Common Crows (*Euploea core*) were spotted on the wing. One Common Crow caterpillar was found on a Monkey Rope vine (*Parsonsia straminea*).
- Magpie moths (*Nyctemera amica*) were seen on the wing and caterpillars were found on the introduced weed, Thickhead (*Crassocephalum crepidiodes*). One caterpillar was being consumed by a predatory bug.

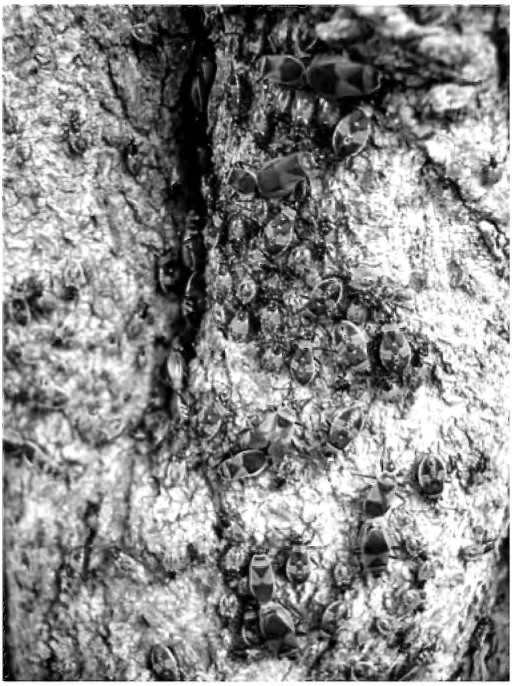
Orange Ringlets (*Hypocysta adiante*)

Brown Ringlet (*Hypocysta metirius*)

Magpie moth larva (*Nyctemera amica*) and predatory bug

Helen Schwencke with additional notes from Frank Jordan
Photos (where not previously credited) Frank Jordan
For more information about the Fox Gully Restoration site visit:
Fox Gully blog at www.foxgully.wordpress.com

LETTERS



Here is a photo of some bugs which don't mind our winter (although they obviously like the sun). I've started a Friends of the Old Cemetery group - took almost 2 years of negotiating with council - I don't know what they thought we might do! - and we've started clearing the waist-high weeds in the entrance garden (such a nice entry for grieving family and friends!). We intend to record the info on the headstones before our strong salt-laden winds sandblast it all off!

I noticed lots of groups of these bugs on a planting of mature Norfolk Island Hibiscus in our old Cemetery (very near the sea) on a sunny day in July 2010.They were mainly on the trunks and in trunk crevices but also on leaves and on, and in, the fruit.

Looking up Bert Brunet's book he says they are Cotton Harlequin Jewel Bugs (*Tectocoris diophthalmus*) or Broody Bugs because the large orange females defend their egg-clutches over winter and then watch over the brood until they disperse. They were accompanied by Harlequin Bugs.

The Norfolk Island Hibiscus trees were looking ratty and I thought we might convince council to replace them with local species but now I've met the bugs I've had to change my tune! **Danie Ondinea, Scarborough NSW**

Photo Danie Ondinea

Ed.: I referred Danie to Densey Clyne's article on *Broody Bugs and Itchy Cows* in *Metamorphosis Australia*, issue 55 December 2009.

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

Annual General Meeting

What: Our Annual General Meeting and election of Office Bearers. IndigiScapes Tea Gardens cater for delicious morning teas, lunches, and afternoon teas at a very reasonable cost if you wish to partake before or after the meeting.

When: **Saturday 2nd April, 2011** from **10am** for the AGM

Where: Redlands IndigiScapes Centre, 17 Runnymede Road, Capalaba

Contact: Daphne 3396 6334 or email daphne.bowden1@bigpond.com to RSVP or for more details.

Planning and Management Meeting

What: Our planning meetings are informative and interesting. As well as planning our activities we share lots of information. All members are welcome as this activity is also a general meeting of members.

When: **Saturday 14th May, 2011** from **1.30 pm**

Where: Ross Kendall's home, 17 Eldon Street, Indooroopilly

RSVP: Ross on 07 3378 1187 or Daphne on 07 3396 6334

Indigi Day Out

What: We will be holding a display with mini workshops on butterflies and native bees. We will have all of our merchandise for sale.

When: **Saturday 4th and Sunday 5th June, 2011** from **10am to 4 pm**

Where: Redlands IndigiScapes Native Botanic Gardens, 17 Runnymede Road, Capalaba

Contact: Daphne 3396 6334 email daphne.bowden1@bigpond.com or IndigiScapes on 3824 8611for more details.

DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

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- Printing of this publication is proudly supported by Brisbane City Council

We would like to thank all these people for their contribution.

Dedicated to a better Brisbane

ARE YOU A MEMBER

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Membership fees are $25.00 for individuals, schools and organizations**. If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership number and surname e.g. **234 Roberts.**

Butterfly and Other Invertebrates Club Inc.
PO Box 2113
RUNCORN Q. 4113

Next event – Annual General Meeting – 2nd April, 2011.
See Programme for details